5.9 For the circuit in Figure 5.38, determine the faults detected by the test 111 by deductive fault simulation (start with a collapsed set of faults)

Figure 5.38

Collapsed fault set

\[
\begin{align*}
a_0 &= d_{10} \\
a_1 &= d_{11} \\
b_0 &= d_{20} \\
b_1 &= d_{21} \\
b_0 &= e_{10} \\
b_1 &= e_{11} \\
b_{20} &= e_{20} \\
b_{21} &= e_{21} \\
c_1 &= e_{22}
\end{align*}
\]

\[
\begin{align*}
L_a &= \{a_0, b_0, c_0\} \\
L_b &= \{b_0, b_1\} \\
L_{b1} &= \{b_{10}, b_{11}\} \\
L_{b2} &= \{b_{20}, b_{21}\} \\
L_c &= \{c_0\}
\end{align*}
\]

\[
\begin{align*}
L_d &= L_a \cup L_{b1} \cup \{d_{10}\} = \{a_0, b_{10}, b_{11}, d_{10}\} = \{a_0, b_{11}\} \\
L_{e1} &= L_b \cup L_{c} \cup \{e_{10}\} = \{b_{20}, b_{21}, e_{10}\} \\
L_{d1} &= L_d \cup L_{e1} = \{a_0, b_{20}, b_{21}, d_{10}\} \\
L_{e1} &= L_e \cup \{e_{11}\} = \{b_{20}, b_{21}, e_{11}\} \\
L_{d2} &= L_d \cup L_{e1} = \{a_0, b_{10}, b_{20}\} \\
L_{e2} &= L_e \cup \{e_{21}\} = \{b_{20}, b_{21}, e_{21}\} \\
L_f &= L_f \cup \{f_{10}\} = \{b_{20}, e_{11}\} \\
L_g &= L_{d2} \cap L_{e2} \cup \{g_0\} = \{a_0, b_{20}, g_0\} \\
L_h &= L_f \cup L_g \cup \{h_0\} = \{b_{20}, e_{11}, a_0, b_{20}, h_0\} = \{b_{20}, e_{11}, a_0, d_{20}\}
\end{align*}
\]